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AGRICULTURAL EDUCATION AND AGRICULTURAL PROSPERITY

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American agriculture is just emerging from the pioneer stage. As long as there was an abundance of free land over which grazing and grain growing were rapidly and extensively spreading, so much livestock and foodstuffs were cheaply produced by the simplest methods that their prices were so low that the farmer had no incentive to seek special training for himself or his sons or to encourage his children to remain on the farm. It is true that inventive genius came to the farmer's aid and provided him with machinery for this extensive agriculture, by which the cost of producing staple crops per bushel or other unit of measure was very greatly reduced. Thus the American farm worker became more efficient than the farm worker of the older countries in the sense that he was able to secure the largest average production per man, though his production per acre was relatively low.

With free land so reduced in amount and availability that its utilization has practically ceased to have any influence on our agricultural production, the economic conditions of our agriculture have materially changed. Production is no longer running so far ahead of demand that our markets are glutted with agricultural products. For this reason alone there would have been a considerable advance in price of these products in recent years. But there have been many causes for their rising prices. When free land was practically exhausted, the price of farm lands began to rise and our last census showed a remarkable advance in farm values. The rapid wearing out of the great ranges for domestic animals, the reduction of yield per acre in the prairie states under a single crop system, the widespread need of fertilizers, the increasing cost of bringing new land into cultivation by clearing, drainage or irrigation, the absolute necessity for more careful and complicated systems of culture and cropping are among the important matters directly relating to agricultural practice which are now affecting

the prices of our farm products. To these must be added the economic and social influences which have caused the advance of prices generally at home and abroad. A complicated and expensive system of distribution has forced the ultimate consumer to pay high prices for his foodstuffs. The great rise in the wages of laborers employed in towns has made farm labor scarce and more expensive. The general rise in the standard of living has brought with it the practical necessity for a greater variety of expenditures on the farm, and among other things is the burden of expensive sanitary regulations. The changes in systems of farming in different regions brought about by the spread of agriculture westward and the growth of industrial population in farming regions have necessitated various new expenses. The transfer of agricultural and home industries, such as butter and cheese making, from the farm to the factory and the consequent narrowing of the sources of farm income must also be considered.

Meanwhile the steady shifting of political and business affairs from an individualistic to a socialistic basis has profoundly affected the status of the farmer. Everybody else has been constantly making wider and wider combinations. The farmer has thus far very largely stood alone, though more and more he has been compelled to deal with organizations rather than with competing individuals. Blindly clinging to the old ideals of life, he has been put at an increasing disadvantage relatively as regards his place in the world. For a time the simple life and freedom of the pioneer seemed to him to overbalance all the advantages of urban life. But now the restraints of modern civilization are becoming more clearly apparent and he begins to realize that other classes have passed him in the race. The natural effect of such an awakening is to create a profound dissatisfaction with country life and an effort to escape from it at the earliest favorable opportunity. If he overcomes this temptation and retains faith in the possibility of an elevating and satisfactory life in the open country he becomes an active advocate of measures for the improvement of the economic and social conditions of the farm.

Fortunately in recent years some of the best things in modern civilization have come much closer to the farmer. The telephone, trolley car, railroad, automobile, rural free delivery of mail, and the parcel post have to a considerable extent destroyed the isol-

tion of the farmer and made possible an enlargement and enrichment of his business and social life. They have brought him much information about the changes that are going on in the world and his need of a broader horizon of knowledge and experience. He sees now, as never before, that if he is to be a man among men in the modern world he must have a broader general education and if he is to be highly successful in the practice and business of agriculture on high-priced land with high-priced labor and with the multifarious expenses of the well-equipped farm and home he must have some definite technical education along agricultural lines.

Therefore, while there are many other things which will be required to put our agricultural communities in satisfactory condition, the fundamental need is a better system of education. This means in the first place a radical reorganization and redirecting of the rural common schools. As agriculture spread out over our vast territories the school teacher went with the farmer over a part of the field but in some large regions was almost wholly absent. Hence great bodies of our farming people have been wholly or nearly illiterate. The campaign against illiteracy, which has gone on with increasing ardor and success for a century, but which has not yet entirely covered the ground, has been waged on the theory that we must have as many schools as possible. Hence for a long time school districts were greatly multiplied in the effort to bring the schoolhouse within the walking capacity of the smallest pupil. In many regions this multiplication of school districts was accompanied by what was considered the essential principle of absolutely local control of the school. Thus the number of petty school officials was indefinitely increased and each school was largely a law unto itself.

Meanwhile the urban communities were using their increasing wealth in building up a strong and highly developed school system and taking into their employ practically all the trained teachers. The country schools therefore while not altogether fulfilling their primary purpose of abolishing illiteracy have relatively fallen far behind the city schools in their range and efficiency. Moreover the subject matter of their curriculum and the methods and attitude of their teachers have been mere imitations of the city schools. Thus as far as the country schools have had any definite influence on their pupils it has been to make them dissatisfied with country life and lead them away from the farm.

While in recent years there have been widespread efforts to remedy the defects of the rural schools, the great educational problem of our day still is to devise a way of equalizing the educational opportunities of country and city children. It is now obvious that this cannot be done on the principle of local control and financial support. Nothing less than state control and the use of state and national funds for the education of all the people will ever give the country children elementary, secondary and higher education in the same way and to the same extent that under our present school system it is provided for city children.

Our educational situation is only a very fundamental and universal example of what is true with reference to the whole country life problem. This can never be solved by the farmers alone. It is a task for our whole people. Sentimental reasons alone will not keep any large body of people in the open country. If the child born on an American farm finds out as he grows up that he cannot get a satisfactory education, have a good chance to own property or live an interesting life in the country, why should he stay there?

The American farmer or farm laborer is not a serf or peasant attached to the land. He is free to move about or change his occupation like all other Americans. He surely does not exist simply to produce cheap foodstuffs or clothing for city people. If he stays in the country it must be because he is convinced that considering his ability and tastes he can personally get the most out of life there. Therefore if city people really feel that they must have a certain number of farmers to support their life and make good business conditions it is absolutely essential under conditions existing in a free democratic nation that they shall contribute their part toward making the home, business and community life of the country people satisfactory to those people.

The manufacturers, bankers, merchants, railroad men, and professional workers can each contribute to this end in various ways. But in any case a fundamental thing is a good system of education for country people.

Present-day pedagogy holds that every child should be trained with definite relation to his physical environment and the common arts on which material civilization depends. What may be called the industrial element should therefore be a part of every system of public education, apart from more strictly vocational training.

This has already led to the widespread introduction of nature study, gardening, cooking and sewing into elementary schools, and natural science, agriculture, wood and metal working and home economics into high schools. Thus far such instruction has chiefly reached children in urban communities. It should be given to the masses of our children in both city and country.

But such general industrial training is not sufficient to fit boys and girls for vocations. There must therefore be added courses and schools for definite vocational training, including both secondary and higher schools. This is being done more and more for mechanic arts, engineering and agriculture.

Public interest in the development of technical and vocational education in this country is rapidly growing. It therefore seems appropriate to include in this article a brief survey of the history and present status of agricultural education.

The American system of agricultural education has been developing for over fifty years, and has been of great service to thousands of farmers but has not yet affected the great mass of them.

Aside from a few scattering efforts at elementary education in agriculture, the first broad movement in that direction was in the establishment of agricultural colleges, begun by the states and nationalized by the Land Grant Act of 1862. At the end of twenty-five years the land grant colleges had become well established in most of the states but their agricultural departments were relatively weak and attracted comparatively few students. This was partly because the agricultural practice required at that time was so crude, but partly because there was so little definite knowledge to teach.

Then came the establishment of research departments mainly in the agricultural divisions of these colleges, under the title of agricultural experiment stations. These stations, also, were begun by the states and nationalized by the Hatch Act of 1887. In about ten years after their establishment they had collected through their own investigations and through the reports of similar institutions abroad a sufficient body of knowledge to enable the agricultural colleges to formulate and undertake effective courses of study in various branches of agriculture. Then students began to increase in number and quality and these colleges entered on a prosperous career.

From the colleges also emanated the beginning of a system of

extension work in agriculture for the benefit of the farmers at their homes. This was done through the free distribution of station bulletins and the holding of local farmers' meetings usually designated "farmers' institutes."

Alongside the colleges and in increasing measure in coöperation with them were developed the United States department of agriculture as a research and extension agency, and the state departments or boards of agriculture, performing to a certain extent similar functions.

In the earlier days much of the instruction in agriculture at the colleges was quite elementary. As the number of students increased the requirements for admission to the regular college courses were raised, there was more specialization of instruction and real college courses in agriculture were developed. To meet the growing demand for the more elementary instruction, short courses not leading to a degree were offered and finally secondary schools of agriculture were definitely organized at some of the colleges to supplement their college courses.

These provisions for secondary courses in agriculture did not long satisfy the people interested in agricultural education. Separate agricultural schools began to be established, courses in agriculture were added to the curriculum of ordinary high schools, and efforts were made to have instruction in subjects definitely related to agriculture introduced into the rural elementary schools. This elementary instruction often took the form of nature study and school gardening, but as time went on an increasing amount of instruction definitely relating to agriculture was developed.

For many years the research and teaching along agricultural lines in all classes of institutions giving attention to these subjects dealt almost exclusively with problems of agricultural production. Within the past decade the vital importance of educational work in rural engineering and rural economics and sociology has so impressed itself on our agricultural leaders that investigations and courses of instruction along these lines have been rapidly developed and enlarged.

The necessity for better training of our agricultural teachers and investigators has also become very apparent. The normal schools have undertaken to do this for elementary teachers. Congress has specifically authorized the agricultural colleges to use a

portion of their federal grants for this purpose. These colleges are quite generally establishing departments of agricultural education. Graduate courses in agriculture are now offered in many of the agricultural colleges. A short-term graduate school of agriculture is held biennially under the auspices of the Association of American Agricultural Colleges and Experiment Stations with a view to stimulating greater interest in the thorough training of agricultural experts. This association is also giving systematic attention to the improvement of agricultural teaching through its standing committee on agricultural instruction which makes an annual report on this subject that is printed and widely distributed. The National Education Association has a section which is giving regular attention to this subject. A National Association of Agricultural Teaching has also been organized. The United States bureau of education and the department of agriculture are employing specialists in agricultural education who are studying this matter throughout the United States and abroad and are issuing bulletins on the pedagogical problems involved in this work and publications containing subject matter organized with special reference to the requirements of the schools along this line.

As already indicated, extension work in agriculture has been going on throughout the country for many years but within the past twelve years has had a very interesting development. When the Mexican cotton weevil began to spread over Texas and it seemed clear that it would extend its ravages to other portions of the cotton belt urgent appeals for help came to the United States department of agriculture. Among the agencies employed by the department to meet this situation was the establishment of a community demonstration farm at Jewett, Texas, under the direction of Dr. Seaman A. Knapp to show "how cotton could be raised despite the boll weevil." This enterprise was successful and similar demonstrations were carried on in other places and extended to other crops with a view to aiding diversification of agriculture in the South. Congress made special appropriations for this work in territory likely to be affected by the boll weevil. The General Education Board, endowed by Mr. Rockefeller, became interested in Dr. Knapp's operations and entered into coöperative agreement with the department, under which large sums from their fund were used for demonstration work in the southern states outside the cotton belt. The states,

counties, local associations and individuals were also encouraged to contribute to this work and their financial support came to be a large factor in the enterprise. The scope of the work, especially along educational lines, was gradually extended to include many matters relating to the economic and social conditions of the farmers and their families, as well as the rural communities in general.

As the work grew it was found desirable to locate agents in the several counties, who should arrange for and supervise the farm demonstrations, hold meetings of farmers at the demonstration fields or elsewhere, visit the farmers at their homes, give out information through the local press, secure for the farmers the publications of the national and state departments of agriculture and the state agricultural colleges and experiment stations, and in general give them and their families advice and assistance along the lines of agriculture and home economics. Existing farmers' organizations were utilized as mediums for the work of the county agents and where such organizations were not available groups of farmers were formed for this purpose.

The importance of interesting the girls and women on the farms was also recognized. Canning clubs were organized among the girls. The members were encouraged to raise tomatoes or other vegetables, were taught how to can the product and were aided in selling the canned goods. At meetings of the clubs not only the matters relating to their work were discussed but also many subjects relating directly to the work of the household. Naturally the women often became interested in the work of the club girls, they were invited to hold their meetings at farm homes, and the women in charge of the clubs were made welcome in such homes. Thus the way was opened to do work for the benefit of the farm women themselves.

The wide success of this demonstration work in the South naturally led to an effort to have similar work carried on in the northern and western states. The office of farm management of the bureau of plant industry therefore undertook work of this character in the North.

Meanwhile the agricultural colleges in various parts of the country had increased the variety and amount of their extension work in agriculture. Special features of this new work were movable schools and the running of railroad trains which carried agricultural exhibits and lecturers who explained them at numerous

stations along the route. The colleges were also drawn into closer coöperation with the demonstration work of the department of agriculture. They formed a special extension section in their national association and undertook to secure from the federal government financial aid for their extension enterprises.

The final result of this effort was the passage of the Smith-Lever Extension Act of May 8, 1914. This provides an annual appropriation of \$10,000 to each state to be used by its agricultural college in extension work in agriculture and home economics. The second year an additional amount of \$600,000 may be allotted to the states on the basis of their rural population provided they contribute an equal amount from sources within the states. This additional amount is thereafter to be increased on the same terms by \$500,000 annually for seven years, after which \$4,100,000 will annually be available for like distribution to the states. If the states fully meet those conditions there will ultimately be an annual fund of \$8,680,000 for the extension work of the colleges. This money is to be spent in accordance with plans made by the colleges and approved by the secretary of agriculture, who is charged with the general supervision of these funds and the administration of the law. The act also provides that this extension work "shall be carried on in coöperation with the United States department of agriculture."

On the passage of this act the secretary of agriculture decided to bring all the extension work of the department into coöperation with the state agricultural colleges in order that thus there might be a unified system for such work throughout the United States. For this purpose "a general memorandum of understanding" was drawn up and signed by the secretary of agriculture and the presidents of the colleges. This provides that the college shall bring all its extension work in agriculture and home economics into a single division with an administrative head and that the department will make a similar arrangement within itself and will then carry on all its extension work in any state which has entered into this agreement through the extension division of the college.

At present this business of the department is carried on by a states relations committee, but in the appropriation act which goes into effect July 1, 1915, Congress has made provision for a states relations service, which will represent the secretary of agriculture

in all his relations with the agricultural colleges and experiment stations. This service will include the present office of experiment stations and offices of extension work, agricultural instruction, and home economics.

The present status of the system of agricultural education being developed in the United States, exclusive of Alaska and the island territories, may be briefly summed up as follows:

Researches covering practically all branches of agriculture and country life are being carried on by the United States department of agriculture and agricultural experiment stations in all the states. These investigations have thus far been chiefly along the lines of agricultural production but are now being rapidly extended into the field of rural economics and sociology.

Graduate instruction in agriculture is given at a considerable number of the state universities and agricultural colleges and through a national summer school of agriculture.

Collegiate instruction in agriculture is given in state agricultural colleges in all the states and by a number of private colleges. In 1914 there were 16,446 students in the regular college courses in agriculture.

Secondary instruction in agriculture is given in short courses and schools organized in the agricultural colleges, in 124 separate agricultural high schools, in 469 public high schools receiving state aid for this purpose, and in a considerable number of other high schools.

Elementary instruction in agriculture in the rural schools is required by law in thirty states and is encouraged by the departments of education in practically all the states. Such instruction is also given in a considerable number of private schools. Nature study, school gardening, and some instruction directly relating to agriculture is given in many city schools. Owing to lack of trained teachers and the poor organization and equipment of the rural schools, effective instruction in agriculture is as yet given in only a relatively small number of these schools.

Many of the normal schools have undertaken the training of teachers in elementary agriculture and home economics but not a sufficient number of their graduates have gone into the ordinary rural schools to affect the teaching there in any large way. The agricultural colleges have in recent years aided in the training of

rural teachers through summer schools. They have also established departments of agricultural education for the professional training of high school and college teachers of agriculture. There is still, however, a great lack of well-trained teachers in all grades of agricultural schools.

A comprehensive system of extension work in agriculture and home economics is now being spread over the United States under the supervision of the state agricultural colleges and the United States department of agriculture and with the coöperation of the state departments of agriculture and education, rural school officers and teachers and organizations of farmers and business men. County agricultural extension agents are now at work in over 1,000 counties distributed through all the states and those agents are assisted by a large force of experts in the various branches of agriculture and home economics sent out by the state colleges and the United States department of agriculture.

While the control of the American system of agricultural education, like other forms of education, has been vested in the states and local authorities, the federal government has contributed in important ways to its development. The bureau of education of the department of the interior has supervision of the federal funds granted to the land-grant institutions, of which the agricultural colleges are a part. In recent years the bureau has also studied the special problems of agricultural education and disseminated considerable useful information on this subject.

The department of agriculture, through its office of experiment stations, has broadly studied problems regarding the organization and work of institutions for agricultural education and with the coöperation of the other bureaus has published considerable material on the subject matter of agricultural instruction. It has also supervised the federal funds granted to the agricultural experiment stations, published a comprehensive review journal of the world's literature of agricultural science and aided the stations in many other ways. And now the newly created states relations service will administer the funds granted to the colleges under the Smith-Lever Extension Act, will carry on a large amount of extension work in coöperation with the colleges and will aid materially in the development of a great system of extension work in agriculture and home economics throughout the United States.

Our system of agricultural education has been further co-ordinated and nationalized through the Association of American Agricultural Colleges and Experiment Stations. This body works through delegates from the state colleges, the bureau of education and department of agriculture, who hold annual conventions and publish proceedings. There are also standing committees on graduate study, instruction in agriculture, college, station and extension policy and organization, which work between the conventions and prepare reports for the proceedings. There are also joint committees of the department of agriculture and the association on their mutual relations and projects, and a joint board of editors for the publication of the *Journal of Agricultural Research*.

This brief summary of the American system of agricultural education is perhaps sufficient to show that it is broadly planned to cover all the technical and practical phases of agricultural practice, the relations of the farmer to the business world, and the organization and life of rural communities. When carried to completion it will provide definite vocational training for our agricultural experts, teachers, and the great mass of our farmers.

But it will do much more than this. It will be, and is already to a considerable extent, the foundation and inspiration of a great intellectual awakening among the agricultural people. It aims to change their viewpoint from the past to the future, to bring them into touch with all the progressive and uplifting influences of the modern world and to broaden immensely their outlook on business and social affairs. If it can do this in a broad way and thus make the great mass of people living in the open country intelligent and progressive it will be one of the largest factors in establishing the perpetuity of our democratic institutions.

In the present stage of the development of the American system of agricultural education, special stress should be laid on the following things:

(1) The provision of suitable means for the scientific and practical training of teachers of agriculture and home economics for the elementary and secondary schools and of the county agents and other extension workers.

(2) Adequate supervision of the teaching of agriculture and home economics in the rural elementary and secondary schools by trained experts connected with the state departments of education who thoroughly understand the problems of country life.

(3) The encouragement of the consolidation and grading of rural elementary schools with a view to the more efficient organization and equipment of practical instruction in agriculture and home economics, as well as their general improvement as educational agencies. Elementary instruction in agriculture and home economics should be given chiefly through practical exercises in gardens or work rooms connected with the schools, supplemented by projects carried on at the home farm or house and supervised by the teacher. This requires better teachers and more equipment than the ordinary rural schools have at present. It is expected that the club work which the extension agents are developing and which should be closely linked with the rural schools will greatly aid in making the instruction in these schools more practical.

(4) The use of state funds to aid in the establishment of high schools in rural regions, in which agriculture and home economics shall be taught by teachers trained along these lines, or the introduction of efficient courses in these subjects in town high schools frequented by country boys and girls. Every child should have at least free tuition in a high school located somewhere near his home. We shall find it necessary to rely chiefly on the high schools for most of the instruction in agriculture and home economics which the farm children will receive.

On its material side this system of agricultural education will undoubtedly do much toward making farming more profitable. It will also greatly increase agricultural production. The wide application of the knowledge acquired by our agricultural institutions would easily double the average yield of our staple crops on lands suited to their culture. This has been demonstrated by the field tests of the experiment stations, by the results obtained by the corn club boys in the South, and by the actual yields in such European countries as France, Belgium and Germany, where economic conditions have promoted intensive cultivation and scientific methods have been widely applied. In addition to this the utilization of vast areas of arable land in our southern states now wholly or largely neglected, the reclamation of the 70,000,000 acres of swamp and wet lands which can be drained, and the irrigation of many millions of acres of the now arid lands of the West will eventually swell our agricultural production to aggregate amounts far beyond

those of today. There is therefore good reason to believe that the American farmers will continue indefinitely to produce an abundant food supply for our increasing population.

Whether the consumers in our cities will be able to obtain food at reasonable prices, after the farmer has received a fair reward for his labor and capital, will depend on the world's food supply and on the cost of distribution after the food leaves the farm.